REMARKS

Applicants respectfully request that the above application be reconsidered. Claims 17-31 are currently pending.

Claim 17 has been amended to emphasize, without disclaimer or prejudice, that the outer layer is porous in each of steps 1, 2 and 3.

Applicants acknowledge the statement at page 2 of the Office Action that the prior objection to the oath/declaration has been withdrawn.

Applicants further acknowledge the statement at page 2 of the Office Action that the prior objection to the drawing has been withdrawn.

Applicants would also like to thank the Examiner for the telephone discussion of May 4, 2005 with Applicants' attorney, Eric W. Guttag, regarding the position taken by the Examiner in paragraph 3 of the Response to Arguments section at page 2 of the Office Action, as well as the last paragraph of page 3 of the Office Action. What was discussed in this May 4 telephone discussion is referred to in the appropriate portion of this amendment below.

A. Response to Rejection of Claims 17-25 and 27-31 under 35 U.S.C. § 103(a) as Unpatentable over Spence et al, in View of Hasz et al

At pages 4-8 of the Office Action (see paragraph 2), the Examiner has again rejected Claims 17-25 and 27-31 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent 5,324,544 (Spence et al), in view of U.S. Patent 5,871,820 (Hasz et al). Briefly, Spence et al discloses a method for protecting fuel contacting surfaces of a gas turbine engine from carbon deposits by applying a coating of alumina and silica thereto from a sol-gel. See abstract. Briefly, Hasz et al discloses protecting thermal barrier coatings by using an impermeable barrier coating that is a dense non-cracked, non-porous layer. See abstract and col. 2, lines 17-31.

Applicants again respectfully traverse this rejection. Contrary to what the Office Action suggests, Spence et al does not teach or suggest the method of Claims 17-25 and 27-31. In particular, Spence et al does not teach or suggest infiltrating the porous outer

layer of the thermal barrier coating with an alumina precursor according to the claimed method. See step 2 of Claim 17. Instead, Spence et al teaches coating the fuel contacting surface/component with a thin, high temperature resistant layer of alumina and silica deposited from a sol-gel. See col. 3, lines 17-22. Nowhere does Spence et al teach or suggest that the deposited sol-gel infiltrates the fuel contacting surface/component, much less a porous outer layer of a thermal barrier coating as in the claimed method.

Indeed, as acknowledged by the Office Action, Spence et al does not teach protecting a thermal barrier coating comprising a non-alumina ceramic layer. Instead, the Office Action relies on Hasz et al to teach protecting a thermal barrier coating from environmental contaminants, and providing a metal substrate with a thermal barrier coating comprising a ceramic layer, such as yttria stabilized zirconia, on a bond coat (referring to the abstract and col. 1, lines 19-56). The Office Action also refers to Hasz et al as teaching depositing the impermeable barrier layer by using sol-gel techniques.

Even if it were properly combinable with Spence et al, which it is not, Hasz et al still fails to teach or suggest infiltrating the porous outer layer of a thermal barrier coating with an alumina precursor according to the method of Claims 17-25 and 27-31. Instead, Hasz et al, similar to Spence et al, forms an impermeable barrier coating on the thermal barrier coating, whether it be deposited from a sol-gel or otherwise. Nowhere does Hasz et al teach or suggest that the deposited sol-gel infiltrates a porous outer layer of the thermal barrier coating as in the claimed method.

In the Response to Arguments section at page 2 (see paragraph 3), the Office Action refers to Webster's online dictionary as defining "infiltrating" as "to cause to permeate something" and that impregnating is defined as "to cause to be permeated." The Office Action then argues that "infiltrating" is synonymous with "impregnating" and then relies on the case of *In re Marra*, 141 USPQ 221 for the position that "the art does not recognize any distinction between coating and impregnating." Accordingly, the Office appears to thus suggest, by strained logic, that there is no art recognized distinction between "coating" and "infiltrating." See also the last paragraph of page 3 of the Office Action.

The suggestion by the Office Action that there is no art recognized distinction between "coating" and "infiltrating" with regard to the method of Claims 17-25 and 27-31 is unsupportable in view of the art relied on (i.e., Spence et al and Hasz et al), and is certainly not supported by the case of *In re Marra*. The case of *In re Marra* involved a rejection of a claimed process for sizing paper by applying a coating composition comprising a ketene dimmer to a cellulose paper web. One of the references (Keim et al) relied on in this rejection taught the use of the claimed ketene dimer in sizing paper.

Applicants' attorney also directs the Examiner's attention to the following relevant paragraph from pages 223-224 of *In re Marra* case:

> We have difficulty accepting the distinction urged by appellants that "coating" differs from "impregnating" in this case. It would appear that a porous material like paper would be impregnated to some extent by an aqueous composition applied "by various coating techniques" as Keim et al. suggests, whether the composition is called "coating" or "impregnating." It seems doubtful that a clearly defined interface between the paper and the coating would result. The differences between coating compositions and impregnating compositions, according to appellants, are in dilution and viscosity. That is, a "coating composition usually has a high-solids content and a relatively high viscosity." It is clear that none of the claims have any limitations on dilution (solids content) or viscosity. The method claim merely recites "applying" the composition which would appear to include both "coating" and "impregnating," and there is no evidence that the art recognizes a distinction. Accordingly, we see not justification for concluding that it is unobvious to employ a sizing agent in either a "coating" composition or an "impregnating" composition. (Emphasis added.)

As the above paragraph from the *In re Marra* case demonstrates, the material (i.e., paper) on which the "coating composition" was to be applied was itself porous, and therefore the "coating composition" would inherently "impregnate" this porous material. Accordingly, and as was pointed out by Applicants' attorney in the May 4 telephone discussion, the Office Action is citing the *In re Marra* case completely out of context, and to improperly justify the strained and unsupportable logic that "coating" and "infiltration" are somehow art recognized equivalents with regard to the method of Claims 17-25 and 27-31.

Indeed, neither Spence et al, nor Hasz et al, suggest that their respective surface/component or thermal barrier coating are in anyway porous such that the applied

coating would inherently impregnate the surface/component or thermal barrier coating. In fact, Spence et al and Hasz et al would suggest just the opposite. Each of these references teach a separate coating layer on top of the respective surface/component or thermal barrier coating. In other words, there is a "clearly defined interface between" the applied coating of Spence et al and Hasz et al, and the respective surface/component or thermal barrier coating.

For at least the foregoing reasons, the method of Claims 17-25 and 27-31, as amended, is unobvious over Spence et al, even in view of Hasz et al.

B. Response to Rejection of Claim 26 under 35 U.S.C. § 103(a) as Unpatentable over Spence et al, in View of Hasz et al, and Further in View of Ceramic and Glasses

At pages 8-9 of the Office Action (see paragraph 6), the Examiner has again rejected Claim 26 under 35 U.S.C. § 103(a) as unpatentable over Spence et al, in view of Hasz et al, and further in view of pages 11, and 752-53 from Volume 4 of the Engineered Materials Handbook (Ceramics and Glasses). Briefly, page 752 of Ceramics and Glasses discloses that: (1) a number of transitional alumina structures can form initially with increasing temperatures, but all structures are transformed irreversibly to alpha alumina with a conrundum structure of a hexagonal system; and (2) alpha alumina is the only stable form above 1200°C (2190°F).

Applicants again respectfully traverse this rejection for at least the same reasons why Claims 17-25 and 27-31 are unobvious over Spence et al, in view of Hasz et al. In addition, Ceramics and Glasses does not teach or suggest that the alpha alumina formed would be finely divided, as defined in Claim 26. Indeed, the Office Action fails to even address where the Ceramics and Glasses teaches or suggests that the alpha alumina formed would be finely divided. Moreover, because Spence et al and Hasz et al fail to teach or suggest infiltration of the alumina within a porous outer layer of a thermal barrier coating, the combination of Ceramics and Glasses with these other two references still fails to teach or suggest the method defined in Claim 26.

For at least the foregoing reasons, the method of Claim 26 is unobvious over Spence et al, in view of Hasz et al, and even further in view of Ceramics and Glasses.

E. Conclusion

In conclusion, Claims 17-31, as amended, are unobvious over the prior art relied on in the Office Action. Accordingly, Applicants respectfully request that Claims 17-31 be allowed to issue in the above application.

Respectfully submitted,

For: John Fredrick ACKERMAN et al

/Eric W. Guttag/

Eric W. Guttag
Attorney for Applicants
Reg. No. 28,853
(513) 856-7272
Customer Number 49305

May 19, 2005